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Too often, search engines don't see and directories can overlook clearinghouses, digital libraries, full-text databases, and learning objects. In contrast, the hidden Web is rich with these high quality and cutting-edge learning materials. By integrating resources from the hidden Web into the classroom, educators extend their instruction in new and valuable directions. This digest is intended to help teachers find key resources--for themselves and their students--and develop techniques for keeping track of the treasures they unearth on the hidden Web so that they can be accessed quickly and easily every time. Discussion includes clearinghouses; virtual libraries; full-text resources; learning objects; and managing hidden Web finds through good bookmarking and Web logging. (AEF)

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Uncovering the Hidden Web, Part II: Resources for Your Classroom

ERIC Digest

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Uncovering the Hidden Web, Part II: Resources for Your Classroom

Marcia Mardis

The majority of teens in America say that they have used the Internet as a major resource for a school project or report (Lenhart, Simon, and Graziano, 2001). Yet, directing these heavy Internet users to locate information with traditional Web search tools is often inadequate; too often, search engines don't see and directories can overlook clearinghouses, digital libraries, full-text databases, and learning objects. In contrast, the hidden Web is rich with these high quality and cutting-edge learning materials. By integrating resources from the hidden Web into the classroom, educators extend their instruction in new and valuable directions.

But how does an educator make practical use of this wealth of information and make it accessible to students? This Digest article will help teachers find key resources—for themselves and their students—and develop techniques for keeping track of the treasures they unearth on the hidden Web so that they can be accessed quickly and easily every time.

Clearinghouses

Clearinghouses are focused web directories. That is, editors select sites to populate hierarchically arranged categories. Directories attempt to cover all topics; clearinghouses focus on a single topic in depth. Many teachers are familiar with K-12 clearinghouses such as Kathy Schrock's Guide for Educators (http://school.discovery.com/schrockguide/), but sites such as the Eisenhower National Clearinghouse (ENC), Michigan Teacher Network, and The Gateway to Educational Materials (GEM), may be less well known.

The Eisenhower National Clearinghouse (ENC) (http://www.enc.org/) is a collection of exemplry K-12 science and math teaching and learning resources supported by the U.S. Department of Education. The collection includes ENC's "Digital Dozen," a selection of particularly outstanding resources. Michigan Teacher Network (http://mtn.merit.edu) is a collection of sites for teachers selected by practicing media specialists in accordance with a thorough collection policy. Where appropriate, resources are connected with specific Michigan Curriculum Framework standards and benchmarks. Since teachers often have to align their classroom activities with state mandated curricula, clearinghouses like Michigan Teacher Network are setting the standard for relevance and applicability for K-12 educators (Pittsley, 2001).

At the Gateway to Educational Materials (GEM) (http://www.thegateway.org), teachers can quickly search for high quality educational materials from the sites of 420 GEM Consortium members, including the ENC, Michigan Teacher Network, American Association of School Librarians, PBS Online, NASA Office of Space Science, National Education Association, Smithsonian Office of Education, to name just a few. GEM's more than 23,000 resources provide educators with quick and easy access to the substantial, but uncataloged, collections of educational materials found on various federal, state, university, non-profit, and commercial Internet sites. Teachers can search by subject, keyword, grade, or education level to link to high-quality lesson plans, activities, and projects. Each resource is directly accessible from this one Web site.

Virtual Libraries

Virtual libraries extend upon the clearinghouse concept to include elements of traditional libraries like digitized books, databases, newspapers, bibliographies, and multimedia. Virtual libraries can also include mailing lists and archives, educational software, electronic newsletters, datasets, links to key organizations, and bibliographies (Bradley, 1999).Where appropriate, actual items are included in the collection rather than just as links to the items' Web sites. Another feature of virtual libraries is that they have mechanisms for users to contribute to the collection; that is, users can rate and review resources as well as recommend items for inclusion. The ability to participate in the review of a resource as well as provide possible use applications is truly the power of searching beyond the open Web.

Infomine Scholarly Internet Resource Collection (http://infomine.ucr.edu/) is a reviewed and annotated group of resources arranged by topic. Infomine is comprised of ten collections ranging from government information to K-12 instructional resources and from maps to Geographical Information System (GIS) data. The collection is searchable and browsable. The Multimedia Education Resource for Learning and Online Teaching (MERLOT) (http://www.merlot.org) uses peer review and user feedback to help establish ratings and profiles of items in its collection. MERLOT covers all instructional areas and is designed for undergraduate educators, but middle school and high school teachers can find a wealth of good resources here as well.

An advantage of virtual libraries and clearinghouses is that it is possible to invest a lot of confidence in the material. Experts check each item in the collection, and a description or summary is made available so that it is easy to gauge appropriateness at a glance. This level of trust is very important since anyone can write almost

anything they wish to and publish it on the Internet (Mardis, 2001). It is very useful to have an independent and authoritative view of a site and the data provided.

Full-text Resources

Quality is often an issue on the Web. The hidden Web is able to offer enhanced quality through topic-specific search tools and dedicated databases. With clear author, date, and publication, full text databases offer quality that often surpasses that of Web pages and can be an effective supplement to a meager periodicals collection. MagPortal (http://www.magportal.com) allows users access to free full-text articles and newsfeeds. FindArticles (http://www.findarticles.com) is an archive of free published articles from more than 300 magazines and journals. The database, which is continuously updated, contains articles on topics such as business, health, society, entertainment, and sports. Newspaper archives can be searched in full text with NewsDirectory (http://www.ecola.com/archive/press/).

Many reference and literary works are available online as well. Project Bartleby (http://www.bartleby.com) is a large collection of complete reference, verse, fiction, and nonfiction works in English. LiTgloss (http://wings.buffalo.edu/litgloss) is a collection of literatures in languages other than English annotated for English speakers. Users can click on a phrase in the full text and receive an immediate translation.

Learning Objects

One of the Web's strengths is that it allows users to go beyond text to bring various media types into the classroom. Although some solutions have been wrought to deal with locating audio and video, the Web is rich with online tools that help teach complex concepts in authentic ways. Due to the limitations of popular search tools, learning objects can be difficult to locate and thus reside in the hidden Web.

A new way of thinking about learning content, learning objects are small units of learning, with lengths of use ranging from minutes to a class period. Each learning object can be taken independently and can be used in multiple contexts for multiple purposes (Wiley, 2000). They often work from within browser, but occasionally, they require browser plug-ins. Examples of learning objects are Java applets, interactive simulations, short video and audio segments, printable course supplements, and Web-based tutorials and assessments.

Teachers may already be familiar with a popular web-based learning object, Filamentality (http://www.kn.pacbell.com/wired/fil/). Filamentality is s a fill-in-the-blank interactive Web site that guides teachers and students through picking a topic, searching the Web, gathering good sites, and transforming collected resources into learning activities. The site offers helpful development tips throughout the process as well as helps users share their completed activities.

The National Institutes of Health's Office of Science Education (http://science-education.nih.gov/homepage.nsf) offers a variety of science-related learning objects. Modeling And Simulation Tools for Education Reform (MASTER) Tools (http://www.shodor.org/master/) is a collection of interactive tools and simulation environments that facilitates observation, conjecture, and modeling activities. Activities include physics, chemistry, medicine, biosciences, and environmental science. The Apple Learning Interchange (ALI) also contains a wealth of applets in their searchable database (http://ali.apple.com/ali/resources.shtml).

Managing Hidden Web Finds

Good bookmarking skills are an important part of every teacher's Internet toolkit. The ability to add, delete, organize, and transfer bookmarks can maximize a browser's usefulness. Although some bookmark management commands are obvious in the browser's menus, some skills are less obvious. Good bookmark files can also form the basis for Web site hotlists on a particular topic. InfoPeople (http://www.infopeople.org/howto) has excellent handouts and helpers on bookmark management. The limitations of bookmark files, however, are that they are easy to alter and they reside on a single computer. And, not all schools allow teachers to upload hotlists to their servers.

Web logging combines the best of bookmarking with the best of Web page creation in a single easy, Web-accessible step. Sign up with a free Web log service, cruise the hidden Web, and with one click, save and annotate a site to a publicly accessible Web page. Blogspot (http://www.blogspot.com) offers free Web logs and Web page hosting. Web logs can even be file transferred to another server.

The hidden Web has a wealth of resources and information for the K-12 classroom. By taking advantage of these unusual finds, teachers can enrich their instruction. Since the hidden Web thrives on user participation, educators have the ability to contribute to the review and use of learning resources. Learning objects allow teachers to go beyond text to communicate concer in effective and new ways. By adopting effective management techniques, these sites can be quickly and easily integrated into classroom activities.

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